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Spaceport News

John F. Kennedy Space Center - America's gateway to the universe

STS-135 crew participates in final TCDT training

By Linda Herridge
Spaceport News

Back in July 1988, astronaut Charlie Bolden climbed into a slidewire basket emergency escape system at Kennedy Space Center's Launch Pad 39B and rode 1,200 feet down to the ground in 22 seconds at a top speed of about 55 mph. When the basket slowed to a stop and hit the safety net, he exited and was later quoted as saying, "It wasn't a thrill ride. It was a very, very gentle ride all the way down."

Bolden, now NASA's administrator, was the only astronaut ever to ride in the slidewire basket to test the system for the Space Shuttle Program. Previously, the system had been tested using sandbags.

On Monday, the crew members for NASA's final space shuttle flight, Atlantis' STS-135 mission, arrived at Kennedy's Shuttle Landing Facility in two T-38 jets to participate in the last Terminal Countdown Demonstration Test (TCDT) for a shuttle launch. That evening, Commander Chris Ferguson and Pilot Doug Hurley practiced shuttle landings in the Shuttle Training Aircraft.

CLICK ON PHOTO *NASA/Kim Shiflett*

Space shuttle Atlantis' STS-135 crew members are instructed on the slidewire basket emergency exit system at Launch Pad 39A during part of the Terminal Countdown Demonstration Test, or TCDT, on June 23. To hear from Mission Specialist Sandy Magnus, click on the photo.

On Wednesday, United Space Alliance Crew Training Instructor Robert Parks briefed Ferguson, Hurley, and Mission Specialists Sandy Magnus and Rex Walheim on emergency egress training in the White Room at the 195-foot-level of Launch Pad 39A. After fire suppression instruction, the astronauts walked to the baskets, which date back to STS-1, climbed in and reached to pull the lever for descent.

"The baskets only move about six inches because they are safety-chained to the pad structure," Parks said. "One crew member releases one of the baskets with sandbags in it. This helps the crew see how the basket travels and how fast."

For the Apollo Program, a single cab on a slidewire, which could hold up to nine people, and take astronauts from the launch tower to the ground beyond the pad's perimeter fence, was used. For the shuttle program, the system was expanded to include several baskets so astronauts and support personnel could exit the vehicle at the orbiter access arm. An earlier Apollo system required astronauts to ride an elevator to the base of the mobile launcher platform and then transfer to a slide tube that ended in an underground rubber room.

Parks, who has worked at Kennedy for 18 years, said he always looks forward to crew training, but this last TCDT puts everything into perspective.

"The reason we're here is to help launch the space shuttle," Parks said. "I feel very honored and privileged to have had the opportunity to work with the flight crews."

According to Markus Zimmerman, a USA systems engineer with Ground Support Systems, the baskets are made of stainless steel with Nomex webbing inside and Gentex fiberglass blankets on the outside.

"Originally, each launch pad had five slidewire baskets," Zimmerman said. "After Challenger, two more baskets were added to each pad."

In order to inspect the slidewire system, two structure technicians hang suspended from a basket by a harness and chair. Zimmerman said they are slowly lowered via the slidewire retrieval winch to inspect the entire 1,500-foot length of wire of each basket for corrosion, breaks and any change in wire size. Changes in wire size would indicate the wire is being stretched.

The STS-135 crew says they have 100 percent confidence in the Kennedy team that prepares their vehicle for flight and makes sure all systems, including the slidewire, are safe prior to launch, which currently is targeted for July 8 at 11:26 a.m. EDT.

Crew members also drove the M113 armored personnel carrier, suited up and traveled to the pad for a simulated launch countdown before heading back to Johnson Space Center in Houston on Thursday.

During a media opportunity at the pad Wednesday, Ferguson said the crew is honored to be flying the final shuttle mission.

"We consider ourselves fortunate, lucky," Ferguson said. "I think each of us feels a little perhaps extra burden to make sure that we put on the best possible face forward for the last go-around of this.

"We're going to go out and do a fantastic job. When it's all over at the very end, I think that's when the enormity of it is going to hit us. That last wheelstop call is going to be a little tough."

Inside this issue ...

Speaker shares vision of leadership, diversity with workers

By Linda Herridge
Spaceport News

NASA/Gina Mitchell-Ryall

Sharon Wong, second from left, addresses Kennedy Space Center workers at the first Asian Pacific American Connection leadership forum, June 15, in the Operations and Checkout Building's Mission Briefing Room. Wong is special assistant to the director of the Office of Diversity and Inclusion at the U.S. Office of Personnel Management.

"Leadership is ultimately about creating a way for people to contribute to making something extraordinary happen."

These were just a few of the encouraging words that guest speaker Sharon Wong shared with attendees at Kennedy Space Center's first Asian Pacific American Connection (APAC) Employee Resource Group leadership forum, June 15, in the Operations and Checkout Building's Mission Briefing Room.

Wong, currently on detail as special assistant to the director of the Office of Diversity and Inclusion at the U.S. Office of Personnel Management, shared her career experiences and offered tips that tied in to the Asian-Pacific American Heritage Month theme, "Diversity, Leadership, Empowerment and Beyond."

"At NASA, we know true inspiration requires a diverse team," said Kennedy Deputy Center Director Janet Petro. "We need people and teams with the best minds and the broadest knowledge. The creation of APAC is a huge step in the right direction."

Wong began her career at Kennedy more than 20 years ago as a payloads lead software integration engineer on the Spacelab Program. From there she transferred to Goddard Space Flight Center in Greenbelt, Md., and currently is the special assistant for diversity.

Petro said that Wong was instrumental in developing various civil advocacy groups, including the Asian-American and Pacific Islander group, at Kennedy.

Some of Wong's advice included: who you know may get you in the door, but what you know is what keeps you in the job, and how you use it gets you ahead. More advice included learning to speak up and speak out, developing networks and using mentors.

"This year's theme is a time to reflect on our own progress and on our history to ensure that we are preparing ourselves for the future and the challenges that come with a world that is rapidly evolving and constantly changing," Wong said. "And I know particularly for NASA and the Kennedy Space Center, with the shuttle program, how much that is changing."

Petro said that Asian-American or Pacific Islanders account for 6 percent of Kennedy's mission critical work force, and 12 percent of the relevant civilian work force, which includes general, computer, electronics and aerospace engineers.

"We compare well in areas like gender and Hispanic employees for diversity in general, but we cannot rest on these laurels and we have to look for improvement in all areas all the time," Petro said.

Petro said the Kennedy Office of Diversity and Equal Opportunity works through other organizations and the center's leadership to recommend and encourage practices to result in a better center profile that will approximate the national demographics.

Lien Moore, a software engineer in Kennedy's Engineering Directorate, is the APAC chairperson. She said APAC's goal is to promote education and awareness in support of NASA's Diversity Policy and the objectives of Kennedy's Diversity Program, with a focus on the Asian-Pacific American segment of the work force. The group, with 38 members so far, formed in February 2011.

Moore said in the near term the group hopes to keep the momentum of its successful debut to promote cultural awareness and enhance team opportunities going with outreach to local schools and communities.

"We're fortunate to have a very talented and dedicated core team," Moore said. "In the long term, we hope to engage closely with the Kennedy community and contribute our part to NASA and the center's goals and objectives. When we thrive as employees and leaders, we will be a more integral part of the team that propels NASA to reach new heights in the 21st century."

Josie Burnett, the International Space Station and Spacecraft Processing Director, said that within APAC are several subcommittees, including education and recruitment, professional networking and development, and community outreach and media support. She listed the 44 countries considered Asian and Pacific Islander, including China, Japan, Indonesia, Singapore, Taiwan, Vietnam and the Philippines.

"All of our cultures are as diverse as our languages and religions," Burnett said. "We are all Americans. And there's a second attribute that unifies us all, and that is NASA."

"We can all be leaders," Wong said. "It is about believing in what you do. It's also about stretching yourselves out of your comfort zones and bringing your personal vision to the forefront and living it."

Work force facts

Kennedy's civil service work force is made up of:
- 33 percent women
- 24 percent minorities
- 6 percent individuals with disabilities

Of 256 Kennedy supervisors:
- 72 are women
- 53 represent minorities
- 3 are individuals with disabilities

Total Asian American or Pacific Islander civil service work force at Kennedy: 4.3 percent

Statistics compiled by Kennedy's Office of Diversity and Equal Opportunity

NASA taps in to Wisconsin students' water recycling system

By Rebecca Regan
Spaceport News

Fifteen-hundred hours, 62 days, nine weeks, or two months -- any way you look at it, a group of Wisconsin middle school students spent a lot of time working on a winning project for NASA's 2011 Waste Limitation, Management and Recycling (WLMR) Design Challenge.

From October 2010 to May 2011, Katelyn, Brianna, Amy, Julia and Maeve, along with their mentor, Christopher Deleon, worked through lunch and after school to develop a highly advanced water recycling system.

"They were all good students, but I think they went to a whole other level with this project," Deleon said of the five girls.

WLMR challenged fifth- through eighth-grade students nationwide to design and test a water recycling system that could be used in space. The reason: It's really expensive to transport critical supplies to destinations beyond Earth's atmosphere, so sustainability is the key to affordability for NASA's future expeditions.

CLICK ON PHOTO *NASA/Jack Pfaller*

The winning team of NASA's 2011 Waste Limitation, Management and Recycling (WLMR) Design Challenge, with NASA Education Specialist Chris Blair, tours Kennedy Space Center's Vehicle Assembly Building on June 13. While at the center, they also visited an orbiter processing facility, Launch Pad 39A, the Space Life Sciences Lab and the Indian River Lagoon. To learn more about Kennedy's commitment to education, click on the photo

Twenty-five teams submitted a final design, tested their systems on a simulated wastewater stream and reported results to a NASA panel comprised of three subject matter experts and three professional educators. Team QNA's Michael Roberts, a lead for Sustainable Systems Research at Kennedy, said the panel was looking for an innovative design that could function in space for long periods of time without the need for a lot of energy or re-supply.

Called "Aqua De Vida," which means "water of life" or "the fountain of youth," the winning team concocted a closed-loop water recycling system design that uses multi-stage filtration, biological treatment and distillation to mimic water recovery on Earth. Their design uses gravity to sieve wastewater through a sand and gravel filter, then through an activated charcoal filter. Filtered water then flows into a biofiltration pond containing bacteria to break down ammonia and Spirulina, a carbon-absorbing and protein-rich, edible cyanobacteria, formerly called blue-green algae. From there, the water trickles into a distillation chamber, where it vaporizes and condenses into drinkable water.

"We all had our own ideas and bringing those together was a challenge," Brianna said. "We really learned to work as a team."

Julia said this solution-seeking project has helped her realize that she would like to be a doctor someday. This solution involved more than just quantity, though; the teammates also had to test the quality of their finished product. To do so, they used a pH test kit, ammonia tester and conductivity meter to determine the number of impurities and nutrients in their filtered water.

"They spent a lot of time researching, building and testing," Deleon said. "I think this was a great learning experience for them to acknowledge that if they put their minds to something, anything is possible."

Part of their kudos for a job well-done included a trip to Kennedy Space Center, where they toured the Space Station Processing Facility, the Vehicle Assembly Building, Orbiter Processing Facility-2, Launch Pad 39A, where space shuttle Atlantis awaits its STS-135 launch, and the Space Life Sciences Lab. They also toured the Indian River Lagoon on a boat and met with NASA scientists and engineers to discuss their design and learn about other sustainability challenges the agency is working to conquer.

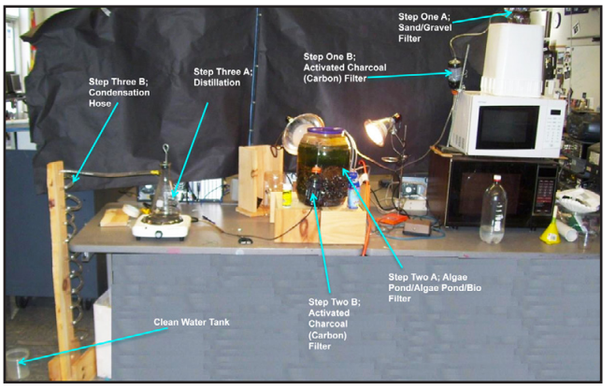
"I think our design can help outside of the space industry, too," said Amy after meeting with Kennedy employees, "Maybe in disaster-stricken areas, like Japan where a tsunami just hit."

Even though Aqua De Vida's system seems complex and is quite bulky, taking up about 8 feet of real estate on the ground, the team says its design can be scaled down for easier transport.

The possibilities don't end there. The system eventually could help boost the immune systems of astronauts on long-duration missions. That's something that could benefit Maeve years from now if she decides to transition from her chosen career path of a member of the Marine Corps to the Astronaut Corps.

"Some of the algae that we used really helps with preventing radiation sickness, or treating it," said Katelyn, who now is considering a career in engineering.

"This NASA middle school opportunity meets science, technology, engineering and mathematics content standards while challenging students to participate in the real-world integrated, multidisciplinary environment critical to the next generation of scientists and engineers," said Cheryl Johnson Thornton, lead of Kennedy's Informal Education.



For NASA

A group of Wisconsin middle school students designed, built and tested this closed-loop water recycling system called "Aqua De Vida" for the NASA's 2011 Waste Limitation, Management and Recycling (WLMR) Design Challenge. WLMR challenged fifth- through eighth-grade students to come up with an innovative water filtration system that could function in space for long periods of time without the need for a lot of energy or re-supply.

Looking ahead

Art Contest: **http://usatodayeducate.com/wordpress/index.php/because-it-flew-home/**

Student launch Imitative (seventh- to 12th-grade rocketry): **www.nasa.gov/offices/education/programs/descriptions/Student_Launch_Initiative.html**

One Stop Shopping Initiative (How to be a NASA intern, etc.): **http://intern.nasa.gov/**

List of Challenges and events: **www.aeronautics.nasa.gov/design_comp.htm**

DIME Microgravity Challenge (Sixth- to 12th grade): **http://spaceflightsystems.grc.nasa.gov/DIME.html**

HAM Radio for ISS (Several opportunities): **www.nasa.gov/audience/foreducators/teachingfromspace/students/ariss.html**

MooonBuggy race (Ninth- to 12th grade): **http://moonbuggy.msfc.nasa.gov/**

Scenes Around Kennedy Space Center

NASA/Carl Winebarger

NASA/Carl Winebarger

KSC BEST BBQ celebrates past, looks toward future

Kennedy Space Center's Black Employee Strategy Team, or BEST, hosted the 2011 KSC BEST BBQ at KARS Park I on June 17.

This year's event celebrated the accomplishments of the space shuttle work force, highlighted the history of the annual barbecue, and welcomed summer students and faculty.

Some of the fun included live jazz music, a homemade dessert contest, a spades tournament, Wii games, tug-of-war and a magician.

For more about BEST, click on a photo.

NASA/Carl Winebarger

CLICK ON PHOTO NASA/Dimitri Gerondidakis

Students from Merritt Island High School in Florida tour facilities, including a launch shelter, at Cape Canaveral Air Force Station on June 13. The students are participating in Kennedy Space Center's Creating Understanding and Broadening Education through Satellite (CUBES) pilot project. They are helping to design a tiny satellite, called a CubeSat, which may one day fly on one of NASA's expendable launch vehicle missions. For more on NASA's upcoming rocket launches, click on the photo.

CLICK ON PHOTO NASA/Gianni Woods

Kennedy Space Center's Environmental Management Branch and Innovative Health Applications Ecological Monitoring Program staff hosted two informational and educational tables June 16 to promote KSC Sea Turtle Awareness and Outreach: World Sea Turtle Day. The event is held to help protect sea turtles and their habitat. To learn how Kennedy co-exists with nature, click on the photo.

CLICK ON PHOTO NASA/Jim Grossmann

Technicians at the Astrotech payload processing facility in Titusville, Fla., conduct solar panel deployment tests June 18 on NASA's Gravity Recovery and Interior Laboratory, or GRAIL, twin spacecraft. The United Launch Alliance Delta II rocket that will carry GRAIL into lunar orbit already is fully stacked at NASA's Space Launch Complex 17B, and launch is scheduled for Sept. 8 For more information, click on the photo.

NASA/Jack Pfaller

Workers use an overhead crane to lift the first stage of a United Launch Alliance Atlas V rocket into the Vertical Integration Facility at Launch Complex 41 at Cape Canaveral Air Force Station on June 13. NASA's Juno spacecraft is scheduled to launch aboard an Atlas V on Aug. 5.The solar-powered spacecraft will orbit Jupiter's poles 33 times to find out more about the gas giant's origins, structure, atmosphere and magnetosphere and investigate the existence of a solid planetary core. For more information, click on the photo.

Modified Ford GT sets speed record at SLF

By Steven Siceloff
Spaceport News

A modified Ford GT set a world record during testing June 16 and 17 when Johnny Bohmer reached 223 mph on the runway of Kennedy Space Center's Shuttle Landing Facility. A Guinness World Records judge authenticated the accomplishment, confirming Bohmer's place in automotive history, along with Kennedy's role in the achievement.

Bohmer's Performance Power Racing modified the car and was testing the suspension and aerodynamic coatings at the runway. The record is the first in the new Guinness category of standing mile for a street-legal car. That means Bohmer began from a standstill and revved up to speeds faster than the space shuttle's average touchdown speed.

"This is probably the best place on the Earth," Bohmer said before the run. "It's very nice, I'm very happy with it. I took it up to 210 (June 16) without trying."

Built for spacecraft returning from orbit at high speeds, the three-mile long concrete runway is becoming a preferred testing ground for drivers and racing teams. Joe Gibbs racing, which competes in NASCAR events, has used the runway for evaluations, as have Indy Car teams.

All pay rent on the facility for each day they use it and the companies sign Space Act Agreements to use it for at least eight days a year, said NASA's David Cox, Partnership Development manager at Kennedy.

"They're teaching us, we're teaching them," Cox said.

The world record came as a bit of surprise for Bohmer and his team because it came during some of the hottest times of the day, conditions that are not typically kind to supercharged engines.

"The hotter the ground gets, the slower your car will go," Bohmer said.

On the other hand, the Performance Power Racing group, based in West Palm Beach, Fla., began setting faster marks on their cars as soon as they started revving them up on the runway. For example, the team brought a Dodge Challenger and drove it to over 170 mph, beating the previous record for that model by almost 30 mph.

"First time out, I was very, very surprised the car went that good," Bohmer said.

From NASA's perspective, the testing has to meet certain criteria such as performing true aerodynamic evaluations, Cox said. Part of the agency's mission now is to move research ahead that can improve fuel mileage for vehicles, so tests on products that reduce drag on a car help meet that criteria.

That's where Jeff McEachen comes in.

McEachran was testing a coating called "PerformaBond" that fills in the microscopic pores in paint and makes the car move through the air that much smoother. Testing is showing a one- to two-percent drag reduction, McEachran said.

"The great thing is that it all coincides, NASA is high-tech and cutting-edge and that's exactly what we want to do," McEachran said.

Although they are street-legal, Bohmer's Ford GT and some of the other cars he brought are equipped with drag chutes to help slow them down at the end of a run, but the shuttle runway is so long that the drivers don't have to use them.

"On the shorter tracks, they have to deploy it every single time and repack it," Cox said. "Here they don't have to do that at all."

"I can go 260 and stop, it's just so long here," Bohmer said.

The International Mile Racing Association set up four tracks with timing gear so they could take advantage of the wind direction for their runs during their two days at the Shuttle Landing Facility. IMRA surveyed the runway and recording official times.

When the company returns, much of their legwork will have already been done and they can spend more time testing.

"Hopefully we can get General Motors and Ford involved and we can use some of NASA's camera equipment and other equipment," Bohmer said. "We have a lot of good ideas."

For NASA

Johnny Bohmer drove this Ford GT to 223 mph on the Shuttle Landing Facility, or SLF, runway June 17, setting a new world record for a street-legal car. Bohmer owns Performance Power Racing, a company that modifies automobiles into high-performance models. To watch a video about the SLF, click the photo.

St. John shares stories of inspiration

By Frank Ochoa-Gonzales
Spaceport News

Guest speaker Bonnie St. John has always shared her dreams in case someone might be able to help them come true.

She shared several stories with Kennedy Space Center workers during the "The Spring 2011 Diversity Event" at the Training Auditorium on June 16.

Despite having her right leg amputated at age 5, St. John has "thrived in situations where the path ahead is not clearly marked, the stakes are high, and the competition is intense."

St. John became the first African-American to win Olympic or Paralympic medals in ski racing.

She says Kennedy workers should share their individual dreams with those that surround them, because "you never know who the person or persons are who might be able to make it come true."

A graduate of Harvard, a Rhodes scholar and a former White House official, St. John told workers they should "remind those of us outside NASA how important what you are doing really is."

For more about Kennedy's Office of Diversity and Equal Opportunity, go to **http://odeo.ksc.nasa.gov/**

CLICK ON PHOTO *NASA/Gianni Woods*

Bonnie St. John shares her experiences with Kennedy Space Center workers June 16 in the Training Auditorium. For more, click on the photo.

Remembering Our Heritage

Payload changeout room supports last shuttle cargo

By Kay Grinter
Reference Librarian

After 29 years of supporting space shuttle missions, the payload changeout room, or PCR, at Launch Pad 39A has been used for the last time to install cargo into a space shuttle's payload bay.

The canister containing the Raffaello multi-purpose logistics module, or MPLM, was hoisted into the PCR on June 17 and the MPLM transferred into space shuttle Atlantis on June 20.

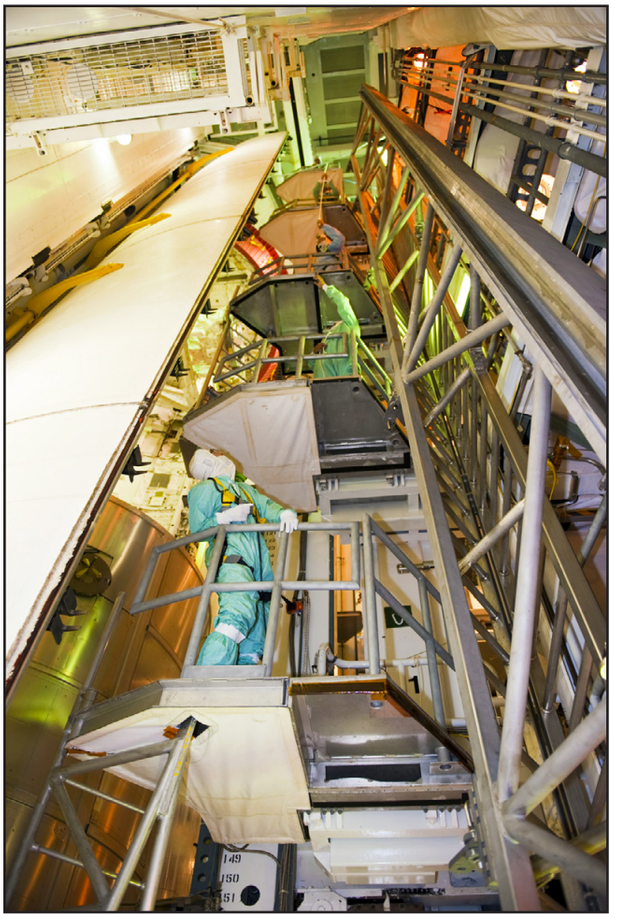
As part of the Rotating Service Structure, or RSS, the PCR is an enclosed, environmentally controlled area that supports payload delivery and servicing at the pad and mates to the shuttle's cargo bay for vertical payload installation. Clean-air purges help ensure that payloads being transferred from a payload canister into the PCR are not exposed to the open air.

Although there was a PCR on both Launch Complex 39 pads, the first 24 shuttle missions lifted off from Pad A while Pad B was being transitioned from an Apollo to a space shuttle pad.

The payload for the STS-4 mission was the first shuttle cargo to be installed from a PCR, arriving at the pad May 22, 1982, a few days before shuttle Columbia's rollout on May 26.

Greg Henry, United Space Alliance, or USA, deputy director of solid rocket booster manufacturing operations, was the pad's first payload move director and supported the first payload transfer from the PCR, which was for the STS-4 mission.

"STS-4 carried a primary Department of Defense payload, DoD 82-1," Henry recalled, "which was a classified instrumentation pallet."



For NASA

In the payload changeout room at Launch Pad 39A, United Space Alliance pad technicians maneuver the Raffaello multi-purpose logistics module into space shuttle Atlantis' payload bay for STS-135, the final shuttle mission. On the platforms of the payload ground-handling mechanism, from left, are Dennis Warren, Robert Minnear, Michael McAllister, Keith Buchner and Gilbert Bond. To read more or to watch videos about the space shuttle era, click on the photo.

The STS-4 cargo manifest also included the first university student experiments, known as Get Away Specials, and the first commercial experiment, which utilized the Continuous Flow Electrophoresis System, or CFES.

"At the pad, the payload canister is lifted and mated to the PCR," Henry explained. "The PCR and canister doors then are opened and the payload is transferred to the payload ground-handling mechanism, or PGHM, a movable payload handling mechanism that is supported by overhead rails in the PCR."

The PGHM has platforms positioned at five levels to provide access to the payload when it is installed on the mechanism and the orbiter payload bay. Each platform has extendible planks that can be configured to accommodate a particular payload.

"That first transfer was the only one done using the original configuration of the PGHM," Henry said. "The original design proved to be operationally impractical for larger multi-payload transfers."

Henry said a major redesign was required of the PGHM front support beams and support fittings that replaced mechanical jack screw operated J-hooks with the current hydraulic cylinder actuated hooks and control panels.

"The design was completed prior to STS-4 pad flow and the actual modification to the PCR and PGHM was accomplished between launch of STS-4 on June 27 and arrival of the STS-5 payloads on Oct. 12," Henry said. "In less than four months, the team replaced the old PGHM payload support beams with stronger beams and support hardware."

They also installed an all new hydraulic system, including pump package control panels and hydraulic lines and J-hook fittings, completed a system proofload, and conducted a validation transfer using payload mass simulators.

"It was an incredible accomplishment in a very short period of time," Henry said.

Richard Jacques, USA lead payload technician for advanced systems, has supported work in the PCR since 1989.

"Since 25 to 30 technicians are needed to transfer the payloads into the orbiter, the payload shop utilizes technicians from the entire launch pad," Jacques said.

"The Hubble Space Telescope launch and servicing missions were the most difficult because the clean room criteria was stricter. We put in many more hours than usual, cleaning every nook and cranny. More attention was paid to anything that would be touched. We even used 'clean-room' paper for any documents needed in the PCR and Kapton tape designed to reduce the tape's outgassing."

Pete Reutt, USA payload mechanical engineer, also started in 1989 and recalled the challenges of payload processing for the Hubble missions.

"Although these were highly sensitive clean missions and we had to go above-and-beyond normal cleaning procedures, it was rewarding to see the telescope filling the payload bay, all by itself, enclosed in its shiny silver blankets and panels. It was an especially beautiful payload," Reutt said.

"Support for STS-125, the last Hubble servicing mission, was particularly complex. The fluid lines and cables had to be connected in the PCR the whole time the payload was undergoing testing, right up until closeout."

Not all of the excitement in the PCR came as a result of normal payload processing operations, Jacques recalled: "After 9/11, a public announcement was made that an inbound aircraft had been spotted in the vicinity of the pad, requiring a complete pad evacuation. We had to safe the systems, get people out of their body harnesses and egress out of the clean room quickly, still wearing our bunny suits (clean-room attire). As it turned out, the alarm was caused by a small aircraft flying down the coastline with its radio turned off. That was a day to remember!"

Following Atlantis' final launch on the STS-135 mission, the fixed and rotating service structures on Pad A will be dismantled. The pad surface, though, is planned to be used to support the liftoff of future rockets carrying NASA astronauts into space.

Kennedy Space Center Calendar

* All times are Eastern

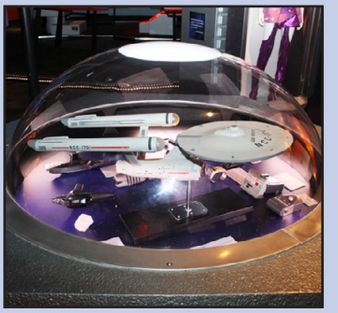
June 24	Veterans Affairs Job Showcase; OSB II, Fifth Floor Conference Room 5109; 8 to 11 a.m. and 1 to 5 p.m. POC: Matthew Bzura, 867-2318 or matthew.a.bzura@nasa.gov
June 24	Amateur Astronomers Star Party; Shiloh Site, off State Road 3; Begins at dark; All are welcome to attend; For a map or more information, go to www.4saleusa.net/kscaa/index.html. POC: Skip Owens, clark.v.owens@nasa.gov
July 6	HOLA Lunch and Learn; KSC Learning Institute; 11:30 a.m. to 12:30 p.m.; POC: Lisa Allen, 867-0640 or alicia.g.allen@nasa.gov
July 20	Federal Aviation Administration Job Showcase; OSB II, Fifth Floor Conference Room 5109; 8 to 11 a.m. and 1 to 5 p.m. POC: Matthew Bzura, 867-2318 or matthew.a.bzura@nasa.gov

Looking up and ahead . . .

* All times are Eastern

Targeted for July 8 Planned for July 20	Launch/KSC: Atlantis, STS-135; Launch: 11:26 a.m. Landing/KSC: Atlantis, STS-135; 7:06 a.m.
No Earlier Than July 14	Launch/CCAFS: Atlas V, GPS IIF-2; Launch window: 2:51 to 3:10 p.m.
Aug. 5	Launch/CCAFS: Atlas V, Juno; Launch: 11:40 a.m.
No Earlier Than September	Launch/CCAFS: SpaceX Falcon 9, Dragon C2; Launch window: TBD
Sept. 8	Launch/CCAFS: Delta II Heavy, GRAIL; Launch: 8:35 a.m. and 9:14 a.m.
No Earlier Than Oct. 8	Launch/CCAFS: SpaceX Falcon 9, Dragon C3; Launch window: TBD
Oct. 25	Launch/VAFB: Delta II Heavy, NPP; Launch window: 5:47 to 5:57 a.m.
No Earlier Than Nov. 7	Launch/CCAFS: Delta IV, WGS 4; Launch window: TBD
No Earlier Than Nov. 25	Launch/CCAFS: Atlas V, Mars Science Laboratory; Launch: 10:21 a.m.
No Earlier Than Dec. 7	Launch/CCAFS: SpaceX Falcon 9, Dragon C4; Launch window: TBD
Early 2012	Launch/CCAFS: Atlas V, AEHF 2; Launch window: TBD
Early 2012	Launch/CCAFS: Delta IV-Heavy, NROL-15; Launch window: TBD
February 2012	Launch/CCAFS: Atlas V, MUOS; Launch window: TBD
May 2012	Launch/CCAFS: Atlas V, RBSP; Launch window: TBD

NASA/Jack Pfaller



NASA/Jack Pfaller

‘Star Trek’ exhibit opens

“Star Trek” memorabilia is being displayed this summer through Sept. 5 the Kennedy Space Centers Visitor Complex.

Appearing for the first time in the southeast, “Star Trek: The Exhibition” is an interactive exhibit of authentic “Star Trek” artifacts from the past 40 years, featuring one-of-a-kind costumes, props and filming models from every “Star Trek” television series and feature film, including a recreation of the U.S.S. Enterprise Bridge from the original series. For more, click on a photo.

NASA/Jack Pfaller

John F. Kennedy Space Center

Spaceport News

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